Deviation 390

Customer Service Addendum

STG - Starkey Tympanette Generation

September 1, 1994 | Cost: N/C | Drain: .28 - .58

Series 9 only:
Uses the Series 9 faceplate only.

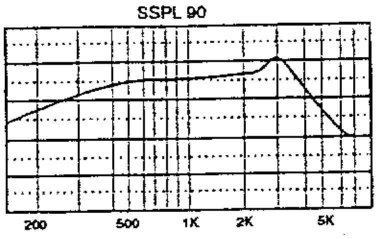
Models -Tympanettes only:

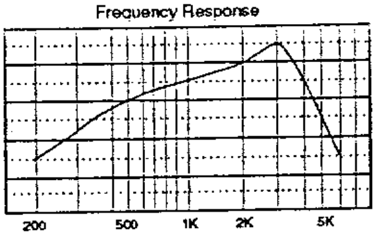
Standard options: SVC
Because of size restrictions, STG is not offered with a volume control. Rotate screw set volume control counter clockwise to decrease gain. SVC is shipped fully clockwise for maximum volume.

General:
Designed to offer the gain and output of LKT in the same size package of the DLG.

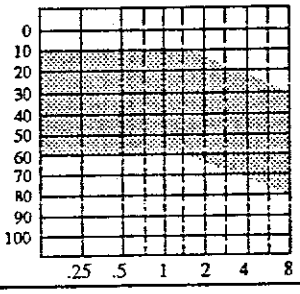
STG is a repackaged LK circuit utilizing a voltage regulator to stabilize the response and a class D receiver to lower drain.

Approximate 2cc response curve for a 20 slope





Fitting Range



MATRICES

100/10/15	102/15/15	107/20/15
	102/15/25	107/20/25
112/25/15	117/30/15	117/35/15
112/25/25	117/30/25	117/35/25
117/40/15	117/45/15	
117/40/25	117/45/25	

OPTIONS

	Color	Marking	Activate
SVC	Black	-	ccw

INCOMPATIBLES

No other options available

QC SPECS

SSPL	±4 dB
Gain	±4 dB
Slope	±4 dB
Dist	15% Maximum
EI Noise	35dB Max with >20dB gain 42dB Max with <20dB gain
Drain	±.1mA

Rec:	ES 3126	100, 102, 107, 112 SSPL
	ES 3127	117
Mic:	EMX 5046	15 slopes
	EMX 5047	25 s lopes

Deviation **392**

Customer Service Addendum

CPT - Custom Power Tympanette

September 8, 1994 | **Cost: $49.99** | **Drain: 1.18 - 1.41**

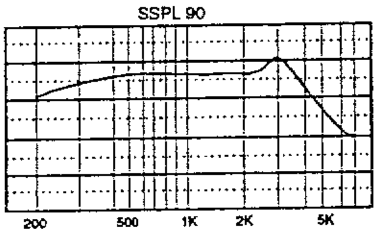
Tympanettes only

Standard option.
SVC
Rotate potentiometer counterclockwise to reduce gain. SVC is shipped fully clockwise for maximum volume.

General:
Designed for patients with a severe hearing loss who desire a Tympanette, there's the Custom Power Tympanette. This circuit provides the highest gain and output available in a CIC hearing aid.

Using a push-pull amplifier CPT uses a n Intra IV faceplate with a 312 battery.

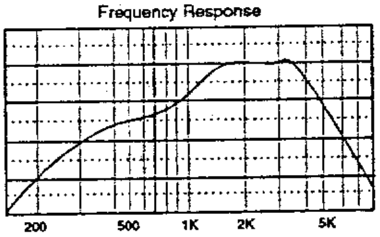
Approximate 2cc response curve for a 10 slope



MATRICES

117/40/10	117/45/10	117/50/10
*120/40/15	*120/45/15	*120/50/15

** Size permitting*

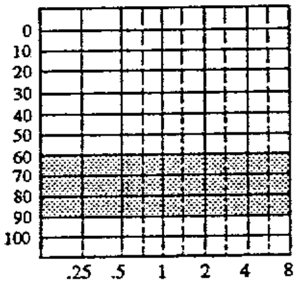


OPTIONS

	Color	Marking	Activate
SVC	Black		ccw

No other option available

Fitting Range



QC SPECS

SSPL	±4dB
Gain	±4dB
Slope	±4dB
Dist	15% Maximum
EI Noise	<35dB
Drain	±.2mA

Rec:	ED 1932	117 SSPL
	EC 3098	120
Mic:	EM 5046	10, 15 slope

Ref No: 72388-221 Rev:A
Category: COMPRESSION

Product: KAC 388A
Title: Product Profile 1

Product Profile

KAC - K-amp "classic" with TILL response for Tympanettes

Cost:
$119.99

Models :
T9

General:
The KAC is a Class D, wide dynamic range, input compression circuit with TILL and Variable Release Compression (VRC) standard.

The TILL (treble increases at lower levels) response allows extra gain to be added to soft high frequency signals. When input signals become louder, exceeding the kneepoint, the gain for low and high frequencies becomes more equal. The compression ratio above the kneepoint is 2:1.

The release times vary according to the length (duration) of the input signal. For short, fast input signals, the release time is very quick; for signals that last longer, the release time is longer and more gradual (Variable Release Compression).

The standard kneepoint of the K-amp is 50 dB. Rotating the TK control clockwise will raise the kneepoint from 50 dB to 65 dB.

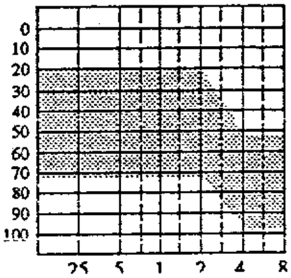
K-amps take a few seconds to power up after they are turned on.

MATRICES

T9

85/15/20	90/20/20	95/25/20	100/30/20	105/35/20	110/40/20

Fitting Range



Product: KAC 388A
Title: Product Profile 2

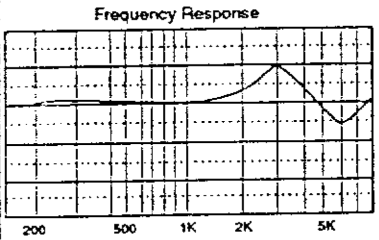
No: 72388-222 Rev:A
Category: COMPRESSION

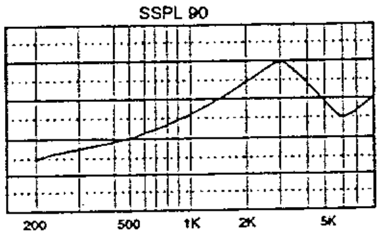
OPTIONS

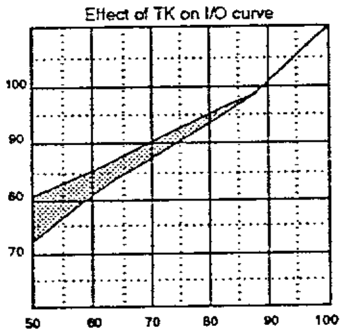
	Color	Marking	Activate	Description
SVC			ccw	Reduces gain approximately 15 dB
TK	Blue	A	cw	Reduces kneepoint 15 dB

OTHER: None

GRAPHS


Frequency Response
200
500
1K
2K
5K


SSPL 90
200
500
1K
2K
5K


Effect of TK on I/O curve
100
90
80
70
50
60
70
80
90
100

QC SPECS

QC SPECS	
SSPL	±4 dB
Gain	±4 dB
Slope	±4 dB
Dist	15% Maximum
EI Noise	<40dB
Kneepoint	49 ±3dB
Attack Time	5 - 30ms (12 ms typical)
Short Release	28 - 82 ms (55 ms typical)
Long Release	265 - 805 ms (535 ms typical)
RTA setting	ANSIADP

SSPL	Drain	Receiver
85	.17-.37 mA	ES 3126
90	.17-.37 mA	ES 3126
95	.17-.38 mA	ES 3126
100	.17-.39 mA	ES 3126
105	.27-.48 mA	ES 3127
110	.27-.49 mA	ES 3127

SLOPE	MIC
20	EM 4068

INCOMPATIBLES

Product Profile

Deviation **356A**

KAT - K-amp circuit for Tympanettes

Cost:
$119.99

Tympanettes only.
This new Buried Capacitor Substrate (BCS) Hybrid has reduced the size of the Kamp enough for use in the Tympanette. The function of the Kamp has not been changed

Standard options: SVC
Rotate SVC (screw set volume control) counterclockwise to decrease the gain. Tympanettes are shipped with the SVC set for maximum gain.

SVC is included as long as there is available space.

General:
K-amp was developed by Mead Killion to enhance speech intelligibility. A three stage input/output function is used to amplify soft sound. Inputs below 65 dB are amplified in a linear manner (1:1), above 65 dB 2:1 compression and a FFR (Fixed Flat Response) is standard. FFR retains a flat frequency response regardless of input. After 85 dB sounds are amplified in a unity gain fashion.

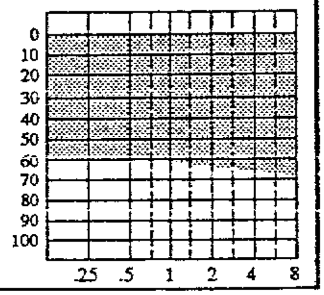
K-amp uses adaptive compression that varies the release time based on length of input signal exceeding the kneepoint. The longer the input the longer the release time.

MATRICES

Tympanettes

92/10/05	97/15/05	102/20/05	107/25/05
92/10/10	97/15/10	102/20/10	107/25/10
92/10/20	97/15/20	102/20/20	107/25/20
			107/30/10
			107/30/20

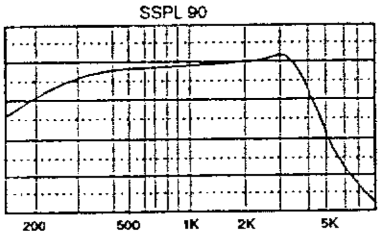
Fitting Range

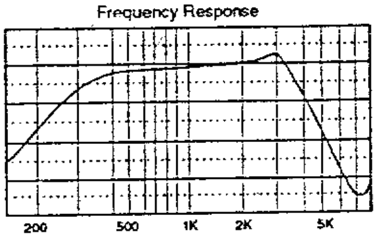


OPTIONS

Color	Marking	Activate	Description
SVC		cw	Rotation clockwise increases gain

GRAPHS





QC SPECS

SSPL	±4.5 dB
Gain	±4 dB
Slope	±4 dB
Dist	15% Maximum
EI Noise	<35dB <42dB with 20 slope matrix - (Gain 10, 15, and20)
Kneepoint	65dB ±5dB (low level)
Attack	16 - 63 mS
Release	Short stimulus: 3-10mS Long stimulus: 180 - 400mS
Drain	±.15mA
RTA setting	ANSIADP

SSPL	Drain	Receiver
92	.33mA	ES 3126
97	.33	ES 3126
102	.33	ES 3126
107	.43	ES 3127

SLOPE	MIC
05	EM 5046
10	EM 5046
20	EM 5047

OPTIONS INCOMPATIBILITY

No other options available

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
USA 55344

P.O. Box 9457
Minneapolis, MN
USA 55440

STARKEY
Laboratories, Inc.

March 27, 1995

Gail Hixon
DDC
Po Box 25166
Denver, CO 80225

Dear Gail:

In response to your letter dated March 25, I have already airborned you the information on the Tympanette (CIC- SAT9) hearing aid and circuits. I also included a more current price list which should have most of the options showing. Since we have so many options, we cannot put them all on the price list, therefore, I have printed copies off the computer on the prices on the other remaining options. I have circled the type, discription, amount and date the option was entered into our system. Sorry, but I thought I did include a price list on the options back in February.

Question 10, There is no Soft Flex Canal, We have Flex canal which should be left on but SSL Soft Seal is obsolete. Keep Flex Canal (FC)

Question 11, Starkey Soft Coat (SSC) is a new material and new option. This takes the place of Soft Seal (SSL or SOFT) which is now obsolete.

Question 12, Correct, Seperate TC should not be used. Use TCS and STC.

Question 14, HDB no longer exists. HDC is now the new option code for HDPII. Whenever we get an order for HDB, we have to call the clinic and clarify because Starkey doesn't have a HDB option.

If you have any further questions, please do not hesitate to give me a call.

Sincerely,
Starkey Labs. Inc

Sue Pehringer

Sue Pehringer
Governmental Services Coordinator

WATS: 800 328-8602
Tel: 612 941-6401

March 25, 1995

TO: Sue Pehringer FAX NO: (612) 828-6985

FROM: Gail A. Hixon FAX NO: (303) 231-5009
PHONE NO: (303) 231-5025

Sue:

This is in reference to your contract number V791P-0047, Custom In-the-Ear Hearing Aids. Please review the attached information and provide the necessary information that will answer our concerns.

1) Information provided for the four circuit options for the CIC model is incomplete. Specifications are required for each as well as a disclosure of what features are included in the base price.

2) Active High Cut -- New item; Not on February 7, 1994 pricelist.

3) Active Low Cut -- New item; Not on February 7, 1994 pricelist.

4) Ultra Shell Processing -- New item; Not on February 7, 1994 pricelist.

5. Linear Masker -- New item; Not on February 7, 1994 pricelist.

6) Tinnitus Maser -- New item; Not on February 7, 1994 pricelist.

7) Compression Masker -- New item; Not on February 7, 1994 pricelist.

8) Separate On-Off Switch -- New item; Not on February 7, 1994 pricelist.

9) Fixed Flat Response -- New item; Not on February 7, 1994 pricelist.

10) Soft Flex Canal -- Flex is all ready listed. Is this a different item? If so, not on February 7, 1994 pricelist.

11) Starkey Soft Coat -- Soft is all ready listed. Is this a different item? If so, not on February 7, 1994 pricelist.

12) Tele Coil -- Telephone Coil & Switch was awarded on the original contract at $13.79. Tel. Coil & Switch w/PreAmp was awarded at $17.24. Currently on DDC's publication list the following is noted:

CE9 and CEL9 list Telecoil switch (TCS)
CEH9 and SAS9 list Telecoil (TC)
SAC9 list Star Telecoil (STC) $17.24

Please clarify, according to the items awarded we should be using Telecoil switch (TCS) and Star Telecoil (STC), not a separate Tele Coil (TC).

13) Class H Amplifier -- New item; Not on February 7, 1994 pricelist. Is the item listed with two different prices, according to model?

14) HDP II -- DDC order codes are managed by DDC. Agree the order code needs to be reviewed. Why are you suggesting (HDC)?

15) SAT9 -- New item. Not on February 7, 1994 pricelist.

16) KAMP -- Option on the CIC, not on February 7, 1994 pricelist.

17) TYMP Compression Class D -- Option on the CIC, not on February 7, 1994 pricelist.

18) Custom Power TYMP -- Option on the CIC, not on February 7, 1994 pricelist.

If you have any questions, please call me at (303) 231-5025. I will be out of the office Monday, March 27, 1995, and should be in the rest of the week.

Gail

Department of
Veterans Affairs

Memorandum

Date: March 21, 1995

From: Coordinators, VA National Hearing Aid Program (126)

Subj: Comments on Modification Requests for Custom In-the-Ear (ITE) Contracts

To: Contracting Officer (905C)

1. The information you provided from current ITE contractors requesting modifications to their contracts has been reviewed.

2. The following are comments regarding each contractor's submission:

a. Argosy - information provided for the three circuit options for the CIC model is complete and satisfactory. The addition of the Adjustable Stabilizer Control to the three models listed is acceptable.

b. Beltone - information provided for the two circuit options for the CIC model is incomplete. Specifications are required. The additions of a gain control for the ODE-MHP model and a low frequency control for the OPERA K model are acceptable.

c. GN Danavox - information provided for the CIC model available with K-AMP circuit only is complete and satisfactory. The addition of a CROS-BICROS cord is acceptable.

d. Qualitone - information provided for the two circuit options for the CIC model is satisfactory and complete except for price. The addition of a Class D receiver as a standard feature (no extra charge) for the UC312 and UC 10 models is acceptable.

e. Starkey - information provided for the four circuit options for the CIC models is incomplete. Specifications are required for each as well as a disclosure of what features are included in the very expensive base price. All other requested additions/changes are acceptable.

f. 3M - information provided for the circuit options for the CIC model is incomplete. Specifications for the compression circuit characteristics including the AGC threshold and compression ratio are required. Also, no prices were listed. The addition of the Preamp Telecoil option is acceptable.

3. Please forward the additional information requested to us as soon as you receive it. We will review it and provide

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL	# of pages ► 2
To Gail Hixon	From E.S. Wintercorn, M.D.
Dept./Agency	Phone # 202 745-8270
Fax # 303-231-5009	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

VA FORM 2105
MAR 1989

you with comments and decisions immediately.

3. If you have any questions, do not hesitate to contact us. We appreciate your excellent efforts as usual.

E. S. Wintercorn, Ph.D.

L. B. Beck, Ph.D.

Department of
Veterans Affairs

Memorandum

Date: March 15, 1995

From: Contracting Officer (905C)

Subj: Modification Request - Contract Number V791P-0047, Starkey Custom In-the-Ear

To: VANHAP Coordinators (126)

1. Attached is a copy my letter dated January 25, 1995, requesting information and pricing on completely-in-the-canal (CIC) hearing aids. Also, notifying the vendor that consideration for additional item(s) to the contract should be submitted now.

2. Attached is a copy of the information received from the vendor. Please review and provide your comments, in writing, to this office. Upon receipt of your comments, a modification will be executed.

3. If you have any questions concerning this matter, please call me.

Gail A. Hixon

Attachments: 2

FAX
STARKEY LABS INC
PO BOX 9457
MINNEAPOLIS, MN 55440
800-328-8602 EXT 2176
FAX 612 828-6985

TO: GAIL HIXON

FROM: SUE PEHRINGER

DATE: 02/08/95

NUMBER OF PAGES (INCLUDING COVER) 6

CHANGE LIST YOU REQUESTED

Sue

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
USA 55344

P.O. Box 9457
Minneapolis, MN
USA 55440

STARKEY Laboratories, Inc.

February 8, 1995

Gail Hixon
Denver Distribution Center
PO Box 25166
Denver, CO 80225

RE: Modification 1
V791P-0047

Dear Gail:

We would like to ammend the above contract to add/change the following items:

OPTION (ADDITIONS)		PRICELIST	VAPRICE	DISCOUNT
Active High Cut (Available on CE9, CEL9, CEH9, SAC9, SAS9)	(AHC)	$19.99	$13.79	31%
Active Low Cut (Available on CE9, CEL9, CEH9, SAC9, SAS9)	(ALC)	$19.99	$13.79	31%
Ultra Shell Processing (Available on CE9, CEL9, CEH9, SAC9, SAS9)	(USP)	$14.99	$10.34	31%
Linear Masker (Available on CE9)	(TML)	$119.50	$82.45	31%
Tinnitus Masker (Available on CE9, CEL9, CEH9, SAC9)	(TM)	$69.99	$48.29	31%
Compression Masker (Available on CE9)	(TMC)	$129.50	$89.35	31%
TrimPro Switch (Available on CE9, CEL9, CEH9, SAC9)	(TPS)	$24.99	$17.24	31%
Seperate On-Off Switch (Available on CE9, CEL9, CEH9, SAC9)	(SOF)	$19.99	$13.79	31%
Fixed Flat Response (Available on CE9, CEL9, CEH9, SAC9,)	(FFR)	$19.99	$13.79	31%

WATS: 800 328-8602
Tel: 612 941-6401
Fax: 612 828-9262

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
USA 55344

P.O. Box 9457
Minneapolis, MN
USA 55440

STARKEY Laboratories, Inc.

RE: Modification 1
V791P-0047

Variable Release Compression (VRC) (Available on CE9, CEL9, CEH9, SAC9)		$39.99	$27.59	31%
Soft Flex Canal (Available on CE9, CEL9)	(SFC)	$29.99	$20.69	31%
Starkey Soft Coat (Available on CE9, CEL9, CEH9, SAC9, SAS9, SAT9)	(SSC)	$19.99	$13.79	31%
Tele Coil (Available on CE9, CEL9, CEH9, SAC9)	(TCS)	$19.99	$13.79	31%
Class H Amplifier (Available on CE9, CEL9, CEH9)	(CLHCE)	$49.99	$34.49	31%
Class H Amplifier (Available on SAC9)	(CLHHC)	$39.99	$27.59	31%
HDP II *	(HDC)	$19.99	$13.79	31%

Please see HDB under deletes. We're correcting DDC Order Code

WATS: 800 328-8602
Tel: 612 941-6401
Fax: 612 828-9262

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
USA 55344

P.O. Box 9457
Minneapolis, MN
USA 55440

STARKEY
Laboratories, Inc

RE: Modification 1
V791P-0047

New Model

Completely In the Canal Tympanette (CIC) Includes 2nd year warranty	SAT9	$649.95	$523.49	19.5%

CIC Circuits

Kamp	(KAT)	$119.99	$82.79	31%
Kamp Classic	(KAC)	$119.99	$82.79	31%
Tymp Compression Class D	(TCD)	$49.99	$34.49	31%
Custom Power Tymp	(CPT)	$79.99	$55.19	31%

1994 YTD SALES ON CIC TYMPANETTE (SA T9) 86,427

1995 YTD SALES ON KAMP (KAT) AND KAMP CLASSIS (KAC) 4,955

1995 YTD SALES ON TYMP COMPRESSION CLASS D (TCD) 394

1995 YTD SALES ON CUSTOM POWER TYMP (CPT) 88

WATS: 800 328-8602
Tel: 612 941-6401
Fax: 612 828-9262
Telex: 297822 STRK UR

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
USA 55344
P.O. Box 9457
Minneapolis, MN
USA 55440

4

STARKEY
Laboratories, Inc.

RE: Modification 1
V791P-0047

Deletes

Please remove DSC from Low Profiles
Please remove AGC (Automatic Gain Control) entirely
Please remove TDSP (Time Domain Signal Processor) entirely
Please remove TCP (Telecoil PreAmp) entirely
Please remove DRO (Dual Receiver Option) on Low Profiles
Please remove FSLC (Full Spectrum Low Cut) on Half Shell, Secret Ear and Intra V
Please remove FSLCS (Full Specturm Low Cut Switch) on Half Shell, Secret Ear and Intra V
Please remove TNK (Tunable Notch Filter) from Half Shell
Please remove HDB (HDP II) from Secret Ear
Please remove ISP (Input Signal Processor) entirely
Please remove PPF (Power Peak Filter) from Secret Ear
Please remove RPC (Resonant Peak Control) from Secret Ear
Please remove TC (TeleCoil) from Secret Ear
Please remove LDC (Low Drain Class D) entirely
Please remove OII (OSP II) from Secret Ear
Please remove SII (Samp II) from Secret Ear
Please remove FLEX (Flex Canal) entirely
Please remove HDB (HDP II) entirely*
Please removd TC (Tele-Coil) entirely

WATS: 800 328-8602
Tel: 612 941-6401
Fax: 612 828-9262

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
U S A 55344

P.O. BOX 9457
Minneapolis, MN
U S A 55440

STARKEY
Laboratories, Inc.

RE. Modification 1
V791P-0047

ALL DISCOUNTS TERMS AND CONDITIONS ARE THE SAME AS THE INITIAL AWARD SCHEDULE AND MARKETING DATA SHEETS SUBMITTED ON THE STARKEY 9 SERIES.

PRODUCTION POINT AND DELIVERY IS THE SAME AS THE STARKEY 9 SERIES.

STARKEY CERTIFIES THAT NO DISCOUNT IN EXCESS OF THOSE DISCLOSED IN THIS MODIFICATION REQUEST HAVE BEEN OFFERED TO ANY OTHER STARKEY CUSTOMER.

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

WATS: 800 328-8602
Tel: 612 941-6401
Fax: 612 828-9262
Telex: 297822 STRK UR

DEPARTMENT OF VETERANS AFFAIRS
Denver Distribution Center
PO Box 25166
Denver CO 80225-0166

January 25, 1995

791/905C
In Reply Refer To:

Sue Pehringer
Starkey laboratories Inc.
PO Box 9457
6700 Washington Ave S
Eden Prairie, MN 55344

Dear Ms. Pehringer:

This is in reference to your contract number V791P-0047, Custom In-the-Ear Hearing Aids.

Consideration for additional item(s) to the above-mentioned contract can be submitted now. Also, we would like to add completely-in-the-canal (CIC) hearing aids to your contract. Provide all circuits and options available with the CIC models.

Contract requirements to modify for additional items are as follows:

"Additional items may be added only when the items offered fall under the same category on which received award. "Discount schedule and Marketing Data" information as required with the original offer; product literature and all applicable published pricelists; and production point and delivery time on the new item(s) shall be furnished. Pricelists shall include effective date. Details of all discounts and pricing plans offered to any customer and sales data substantiating commerciality of the products offered must be submitted. If all discounts, terms and conditions are the same as the initial award, a statement to that effect is required. A certification that no discounts in excess of those disclosed in the modification request have been offered to any customer is also required. Consideration for adding items will be given (6) months into the contract period, and every six (6) months after that for multi-year contracts."

Upon receipt of the information, reviews and determinations will be made. The additional items will not be added to the contract until April 1, 1995. Please submit the requested information to this office, prior to February 8, 1995.

If you have any questions concerning this contract, please contact me at 303 231-5025.

Sincerely,

Gail A. Hixon
Contracting Officer

Department of Veterans Affairs

Memorandum

Date: January 6, 1995

From: Coordinators, VA National Hearing Aid Program (126)

Subj: Contract Adjustments to Include CIC Hearing Aids

To: Contracting Officer (905C)

1. It is requested that contracts for the current eight vendors for custom in-the-ear hearing aids be amended to include completely in the canal (CIC) models. These amendments should also include all the circuits and options available with the CIC models.

2. March 31st marks the end of the first six months of the contract period and the timeframe in which new items can be added. It is hoped that CICs will be available to VA Audiology clinics shortly after April 1.

3. Thank you in advance for your attention to this matter.

E.S. WINTERCORN, Ph.D.
Coordinator, VA
National Hearing Aid Program

L.B. Beck

L.B. BECK, Ph.D.
Associate Coordinator, VA
National Hearing Aid Program

WPM. Op *** Wholesale Price Maintenance *** (Starkey :MN)

Type CE HQ or Part-Num - Mirror To Company

Model Ref CE HQ SaleCode 103
Desc SEQUEL HALF SHELL Desc Alt

Price:Wholesale 0084900 NewWholesale Effective
Retail 0295000

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 10000 30 Category/Sub CE MOD

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

EdpFlag 0

5/30/95 LW184

2/14/96

I CERTIFY THAT THE PRICES THAT ARE REFLECTED IN THIS DOCUMENT ARE OUR STANDARD COMMERCIAL PRICES AND ARE SOLD IN SUBSTANTIAL QUANTITIES TO THE GENERAL PUBLIC. STARKEY LABS. AUTOMATICALLY GIVES A $200.00 DISCOUNT ON THE $849.00 PRICE.

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

WPM. Op *** Wholesale Price Maintenance *** (Starkey ...)

Type CE Q or Part-Num - Mirror To Company

Model Ref CE Q SaleCode 101
Desc SEQUEL CE Desc Alt

Price:Wholesale 0084900 NewWholesale Effective
Retail 0295000

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 10000 30 Category/Sub CE MOD

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

EdpFlag 0

5/30/95 LW184

2/14/96

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SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

WPM. Op *** Wholesale Price Maintenance *** (Starkey)

Type SA CQ or Part-Num - Mirror To Company

Model Ref SA CQ SaleCode 104
Desc SEQUEL CANAL Desc Alt

Price:Wholesale 0084900 NewWholesale Effective
Retail 0295000

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 10000 30 Category/Sub CE MOD

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)

Qty	ModelRef	Desc	UC	SaleCode	Serial	Amount

EdpFlag 0

5/30/95 LW184

2/14/96

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Sue Pehringer

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

WPM. Op *** Wholesale Price Maintenance *** (Starkey :MN)

Type SA SQ or Part-Num - Mirror To Company

Model Ref SA SQ SaleCode 105
Desc SEQUEL A10 Desc Alt

Price:Wholesale 0084900 NewWholesale Effective
Retail 0295000

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 10000 30 Category/Sub CE MOD

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

EdpFlag 0

8/03/95 LW186

2/14/96

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Sue Pehringer

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

WPM. Op *** Wholesale Price Maintenance *** (Starkey . .)

Type CE LQ or Part-Num - Mirror To Company

Model Ref CE LQ SaleCode 102
Desc SEQUEL LOW PROFILE Desc Alt

Price:Wholesale 0084900 NewWholesale Effective
Retail 0295000

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 10000 30 Category/Sub CE MOD

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

EdpFlag 0

5/30/95 LW184

2/16/96

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Sue Pehringer

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

Department of Veterans Affairs

Memorandum

Date: January 24, 1996

From: VANHAP Coordinator (126)

Subj: Modification Request - Contract V791-0047, Starkey Laboratories

To: Contracting Officer (905C)

1. The NIST evaluation of the Sequel indicates that the circuit performs well. It is a useful addition to current contract options; however, the cost seems unreasonably high.

2. I am requesting that you negotiate the price of the Sequel. If you are unable to reduce the cost of the circuit, we will have to consider either not including it as a contract option or developing guidelines for utilization.

L B Beck

L. B. BECK, Ph.D.

2-13-96
Renegotiation, w/ Dr. Beck
No mod acceptance
Ultra Shell Process
Gail

VA FORM MAR 1989 **2105**

*U.S. GPO: 1991-282-80

DEPARTMENT OF VETERANS AFFAIRS
Denver Distribution Center
PO Box 25166
Denver CO 80225-0166

December 6, 1995

In Reply Refer To: 905C

Sue Pehringer
Starkey Laboratories, Inc.
PO Box 9457
Minneapolis, MN 55440-9457

Dear Ms. Pehringer:

This is in reference to contract number V791P-0047, Custom In-the-Ear Hearing Aids.

The Sequal Dual Stage Compression Circuit must be evaluated by NIST. Please contact Dr. Beck about building an aid for KEMAR. Also, provide more information about the Ultra Shell Process and specifications about the compression characteristics. Dr. Beck can be reached at (202) 745-8270.

The Class H Amplifier options are not required by the VA and will not be added to the contract. The Active Output Limiting Pot is acceptable and will be amended to the contract. The Threshold Kneepoint Pot is on the contract and listed on our publication list.

Upon completion of the testing, a determination will be made. A supplemental agreement will be issued to modify the contract accordingly. Your prompt attention to this matter will expedite this process.

Sincerely,

Gail A. Hixon
Contracting Officer

Department of Veterans Affairs

Memorandum

Date: September 19, 1995

From: VANAP Coordinator (126)

Subj: Modification Request--Contract V791P-0047, Starkey Laboratories, Inc.

To: Contracting Officer (905C)

1. Please direct Starkey to provide more information about the Ultra Shell Process.

2. The Active Output Limiting Pot is acceptable.

3. The Sequal Dual Stage Compression Circuit must be evaluated by NIST. Please direct Starkey to contact me about building an aid for KEMAR as well as specifications about the compression characteristics.

4. The Class H Amplifier options are not required by VA.

5. The Threshold Kneepoint Pot is acceptable.

6. The Sequal circuit is very expensive. Pending NIST evaluation, I am requesting that you examine pricing for this circuit.

L B Beck

L. B. BECK, Ph.D.

VA FORM MAR 1989 2105

*U.S. GPO: 1991-282-604/27336

World Headquarter
6700 Washington Ave. S
Eden Prairie, MN
USA 55344-3476

P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

September 5, 1995

Gail Hixon
Denver Distribution Center
PO Box 25166
Denver, CO 80225

RE: Modifacation 2
V797P-0047

Dear Gail,

Per your phone call of today, yes we would like SII (Samp II) back on the Secret Ear (SAS9) model.

This was an error on our part and should not have been removed.

If you have any further questions, please do not hesitate to give me a call.

Sincerely,
Starkey Labs. Inc

Sue Pehringer
Governmental Services Coordinator

WATS: 800 328-8602
Tel: (612) 941-6401

Department of
Veterans Affairs

Memorandum

Date: August 25, 1995

From: Contracting Officer (905C)

Subj: Modification Request -- Contract V791P-0047, Starkey laboratories Inc.

To: VANHAP Coordinator (126)

1. Attached is a copy of my letter dated August 13, 1995, notifying the vendor that consideration for additional item(s) to the contract should be submitted now. Also, attached is a copy of the information received from the vendor. Please review and provide your comments, in writing, to this office. Upon receipt, a modification will be executed.

2. If you have any concerns, please call me.

Gail A. Hixon

Attachments: 2

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
USA 55344-3476

P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

September 22, 1995

Gail Hixon
Denver Distribution Center
PO Box 25166
Denver, CO 80225

RE: Modification 2
V791P-0047

Dear Gail:

We would like to ammend the above contract to add/change the following items:

OPTION (ADDITIONS)		PRICELIST	VAPRICE	DISCOUNT
Ultra Shell Process (Available on CE9, CEL9, CEH9, SAC9, SAS9, SAT9)	(USP)	$14.99	$10.34	31%
Active OutPut Limiting Pot (Available on CE9, CEL9, CEH9, SAC9,)	(AOP)	$19.99	$13.79	31%
Discovery Secret Ear (Replaces previous DSC on Secret Ear)	(DSE)	N/C	N/C	
Sequal Dual Stage Compression Circuit (Available on CE9, CEL9, CEH9, SAC9, SAS9, N/C ON CIC)	(SEQ)		$223.00	see attached sheet
Class H Amplifier (Available on CE9, CEL9, CEH9)	(CLHCE)	$49.99	$34.49	31%
Class H Amplifier (Available on SAC9)	(CLHHC)	$39.99	$27.59	31%

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Tel: (612) 941-6401
Fax: (612) 828-9262

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6700 Washington Ave. So.
Eden Prairie, MN
USA 55344-3476

P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

ADD EXISTING ITEMS: RE: Modification 2
V791P-0047

Threshold Kneepoint Pot (TK) to CEH9 AND SAC9

Deletes

Please remove CLD (Class D) from CE H9, SAC9, and SAS9
Please remove FSLC (Full Spectrum Low Cut) entirely
Please remove FSLCS (Full Spectrum Low Cut Switch entirely
Please remove VRC (Variable Release Compression) entirely
Please remove TCS (TeleCoil) entirely

1995 YTD SALES ON SEQUAL (SEQ) ARE 2,000

ALL DISCOUNTS TERMS AND CONDITIONS ARE THE SAME AS THE INITIAL AWARD SCHEDULE AND MARKETING DATA SHEETS SUBMITTED ON THE STARKEY 9 SERIES.

PRODUCTION POINT AND DELIVERY IS THE SAME AS THE STARKEY 9 SERIES.

STARKEY CERTIFIES THAT NO DISCOUNT IN EXCESS OF THOSE DISCLOSED IN THIS MODIFICATION REQUEST HAVE BEEN OFFERED TO ANY OTHER STARKEY CUSTOMER.

Sue Pehringer

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

WATS: 800 328-8602
Tel: (612) 941-6401
Fax: (612) 828-9262

World Headquarters
6700 Washington Ave. So.
Eden Prairie, MN
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P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

MODEL WITH SEQUAL	OPEN MARKET PRICING	VA PRICING	DISCOUNT
CE	$649.00	$371.73	42.72%
LOW PROFILE	$649.00	$384.23	40.79%
HALF SHELL	$649.00	$420.72	35.17%
CANAL	$649.00	$452.08	30.34%
SECRET EAR	$649.00	$497.07	23.40%

AUGUST 22, 1995

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SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

WATS: 800 328-8602
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World Headquarters
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USA 55344-3476

P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

WPM. Op *** Wholesale Price Maintenance *** (Starkey :MN)

Type AOP or Part-Num - Mirror To Company

Model Ref AOP SaleCode
Desc ACTIVE OUTPUT LIMITER Desc Alt

Price:Wholesale 0001999 NewWholesale Effective
Retail 0006999

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 10000 55 Category/Sub ALL COP

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

EdpFlag 0

4/06/95 LW186

AUGUST 22, 1995

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SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

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USA 55344-3476

P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

WPM. Op *** Wholesale Price Maintenance *** (Starkey :MN)

Type CLHCE or Part-Num - Mirror To Company

Model Ref CLHCE SaleCode
Desc CLASS H AMPLIFIER Desc Alt

Price:Wholesale 0004999 NewWholesale Effective
Retail 0014999

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 12380 Category/Sub ALL COP

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

Flag 0

12/08/94 LW186

AUGUST 22, 1995

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Sue Pehringer

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

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Fax: (612) 828-9262

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USA 55344-3476

P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

WPM. Op *** Wholesale Price Maintenance *** (Starkey :MN)

Type USP or Part-Num - Mirror To Company

Model Ref USP SaleCode
Desc ULTRA SHELL PROCESS Desc Alt

Price:Wholesale 0001499 NewWholesale Effective
Retail 0004499

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 12300 Category/Sub ALL COP

Itemtax States: (States updated only when adding)

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

EdpFlag 0

1/21/94 LW186

AUGUST 22, 1995

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) THE GENERAL PUBLIC.

SUE PEHRINGER
GOVERNMENTAL SERVICES COORDINATOR

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Fax: (612) 828-9262

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6700 Washington Ave. So.
Eden Prairie, MN
USA 55344-3476

P.O. Box 9457
Minneapolis, MN
USA 55440-9457

STARKEY
Laboratories, Inc.

WPM. Op *** Wholesale Price Maintenance *** (Starkey :MN)

Type CLHHC or Part-Num - Mirror To Company

Model Ref CLHHC SaleCode
Desc CLASS H AMPLIFIER Desc Alt

Price:Wholesale 0003999 NewWholesale Effective
Retail 0011999

Unit/Pkg 001 Refund? Y CatalogItem? N
Groups 12380 Category/Sub ALL COP

Itemtax States: (States updated only when adding)
CA

Edit Entry:(0=MustNotEnter; 1=MustEnter; 2=MayOverride)
Qty ModelRef Desc UC SaleCode Serial Amount

EdpFlag 0

12/08/94 LW186

AUGUST 22, 1995

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GOVERNMENTAL SERVICES COORDINATOR

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Tel: (612) 941-6401
Fax: (612) 828-9262

Technical Services UPDATE

Class H

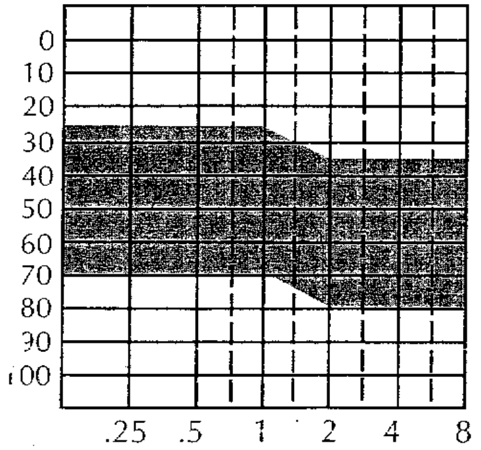
The Power Saver

- Current-efficient, economical circuit.
- Current drain adapts to the requirements of the input signal.
- Optional Resonant Peak Control.
- Performance advantages of Class A with battery life similar to Class D.

Specifications

Peak SSPL-90	100-117 dB SPL
HFA SSPL-90	99-114 dB SPL
Peak Gain	25-45 dB
HFA Gain	20-37 dB
Eq. Input Noise	<35 dB
Frequency Range	200-6400 Hz
Battery Current	.23-1.01 mA
Total Harmonic Distortion	<15%

Suggested Fitting Range



EXTENDED BATTERY LIFE AMPLIFIER

"Sliding A" Technology

The Class H, or "Sliding A," amplifier uses a "sliding" bias current that provides only enough power to reproduce the input signal, no more and no less. The result is extended battery life with the performance capabilities of Class A.

Class H vs. Class A

A traditional Class A hearing aid amplifier operates with a fixed bias, meaning that the average current stays the same for any input signal. To control distortion levels, the bias is set so there is sufficient headroom for loud sounds (strong input signals). Weaker signals are amplified with the same average current, resulting in wasted current drain.

The Class H circuit was designed to improve on the performance of a standard Class A. This circuit adapts the bias of the output stage to the requirements of the input signal. For a low-level input signal, the bias is low, resulting in low battery drain. For a high-level input signal, the bias of the output stage rises to allow amplification of the higher signal, drawing more battery current. When the level of the input signal drops again, the bias drops back down and so does the battery current. In this way, the bias on the output stage "slides" up and down to allow amplification of the input signal as it varies. This variation in output current leads to much higher efficiencies in the output stage, and thus to longer battery life. The current drawn from the battery is only that which is required to amplify the output signal and no more.

Class H vs. Class D

When designed properly, all three classes (A, B, & D) have excellent sound quality. The limitations of each are primarily due to restrictions caused by hearing aid batteries. Class D was originally created as a more flexible, battery-saving alternative to Class A. Clinical evaluations of the Class H circuit found it to have a similar economy of battery life.

The Class H circuit is primarily available as a Series 8 option and can be obtained in the CE 8 and INTRA IV styles. It is specifically employed in the Feedback Reduction Circuit, because its advanced circuit architecture makes it especially useful for providing a frequency response configuration having a primary emphasis at 1800 Hz. A recommended option is the Resonant Peak Control, which allows the dispenser to shift the response peak between 1000 and 2000 Hz.

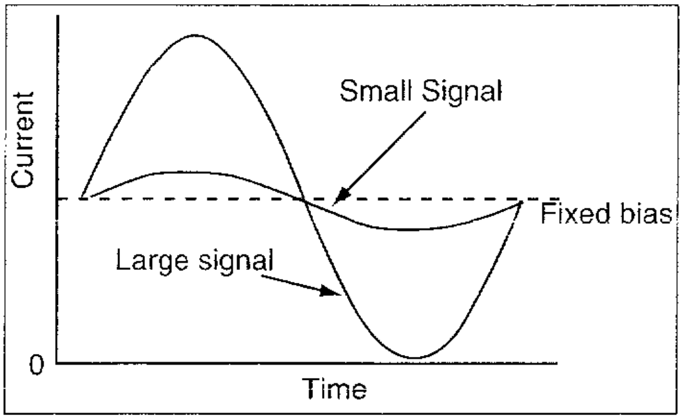
Since the Class H circuit provides exceptional battery life when compared to standard Class A circuits, it can also be ordered with a Canal Resonance Response configuration if desired. Further, by request, the Class H circuit can be obtained with Series 9 faceplates, to take advantage of the excellent construction and fitting advantages they offer.

A Publication of the Starkey Technical Services Divisi

Specifications on Back

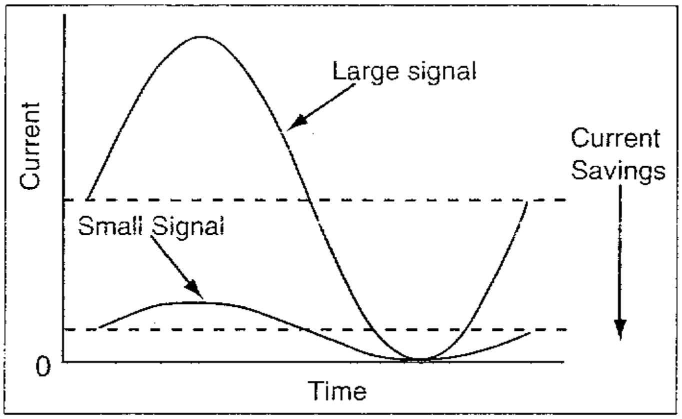
Technical Services UPDATE

Class H


Current
Small Signal
Fixed bias
Large signal
0
Time

Standard Class A Amplifier:

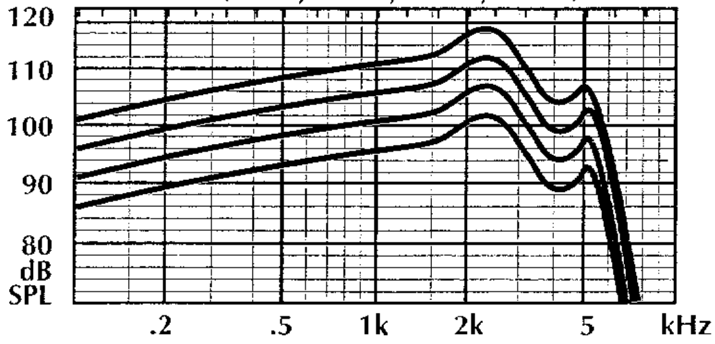
In a standard Class A amplifier, the bias, or average level of current drain, is fixed at a specific level that allows sufficient headroom for strong signals (loud sounds) while maintaining enough current to avoid distortion. The bias current remains the same no matter the strength of the input signal. As a result, small signals receive more bias current than is actually needed. If the bias is adjusted to a lower setting, increasing battery life, there is a greater likelihood of distortion and/or noise.


Current
Large signal
Current Savings
Small Signal
0
Time

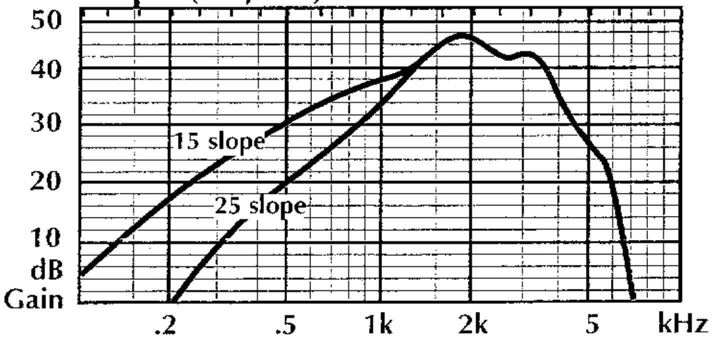
Class H Amplifier:

The Class H amplifier features a "sliding" bias that adjusts the current based upon the strength of the incoming signal. Smaller input signals, which require less current, cause the amplifier to reduce the bias current. This results in current savings and increased battery life. When the input level increases, the bias increases accordingly, maintaining proper balance between battery drain and output level.

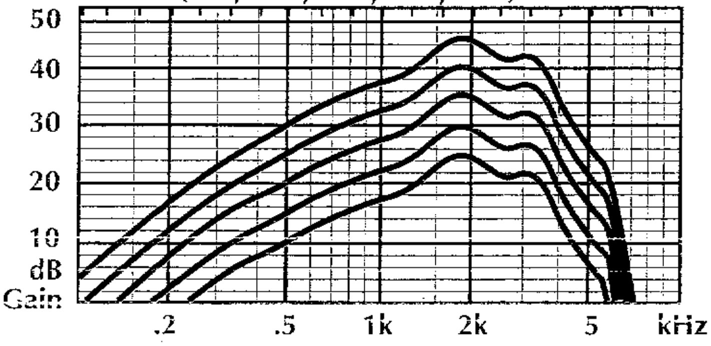
SSPL90 (102, 107, 112, 117)


120
110
100
90
80
dB
SPL
.2
.5
1k
2k
5
kHz

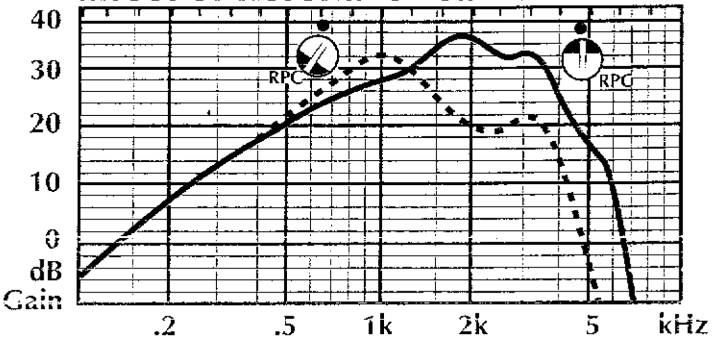
Slope (15, 25)


50
40
30
20
10
dB
Gain
15 slope
25 slope
.2
.5
1k
2k
5
kHz

Gain (25, 30, 35, 40, 45)


50
40
30
20
10
dB
Gain
.2
.5
1k
2k
5
kHz

Effect of Resonant Peak Control


40
30
20
10
0
dB
Gain
RPC
RPC
.2
.5
1k
2k
5
kHz

The goal of Starkey's Sequel Dual Stage Compression product development team was to develop a product that could achieve the performance of advanced hearing aid systems, include features that had not previously been available, and still maintain the practicality needed for the manufacturing and clinical application of advanced technology.

Sequel was developed to provide an alternative technology choice to digitally-controlled signal processing, but without the inherent limitations of bipolar-based analog systems.

The Sequel product goals were pursued through the use of Starkey's proprietary SMArT System, which combines mature analog design concepts with the advanced performance of state-of-the-art electronic technology.

Available Matrices:

Sequel CE•9

105/25/10	105/25/20
110/30/10	110/30/20
112/35/10	110/35/20
112/40/10	110/40/20
112/45/10	112/45/20
117/40/10	117/40/20
117/45/10	117/45/20
117/50/10	117/50/20

Sequel Low Profile

105/25/10	105/25/20
110/30/10	110/30/20
112/35/10	110/35/20
112/40/10	110/40/20

Sequel CC•9
Sequel Half Concha

100/20/10	100/20/20
100/25/10	100/25/20
105/30/10	105/30/20
110/35/10	110/35/20
110/40/10	110/40/20

DUAL STAGE COMPRESSION

SEQUEL

The result of the development of the SMArT System is a series of hearing instruments that display the following features: low current drain, wide-range active filters, full dynamic range compression capability, total harmonic distortion and intermodulation distortion of less than 10% over the whole range of audio inputs, self-calibration of gain when the power is applied, and immunity to performance degradation over the lifetime of the battery.

Available Features:		CE•9, Low Profile	CC•9, Half Concha
ALC	Active Low Cut	••	••
VHC	Variable High Cut	••	•
TPS	Low Cut Switch	•	•
SOF	On/Off Switch	•	
BX	BiCROS	•	
OW	Screw Set VC	•	•
STC	StarCoil	•	

• – Available Feature
•• – Standard Feature

STARKEY

Plf FOIA Resp 000216

PRELIMINARY SPECIFICATIONS

Sequel Dual Stage Compression, Starkey's advanced SMArT System product, contains all the features of advanced instrumentation while maintaining the practicality necessary for today's marketplace. Available in both ITE and ITC styles, Sequel eliminates forward distortion products while providing a wide-band, fully adjustable frequency response. The following are some of Sequel's product features:

Doubled battery voltage for all critical signal processing circuits. This allows a 6dB improvement in headroom to improve distortion and noise performance.

Dynamic Pre-Amplifier (patent pending): This circuitry controls the amplification in the preamplifier such that the signal at the output contains no perceptible distortion (see Figure 1).

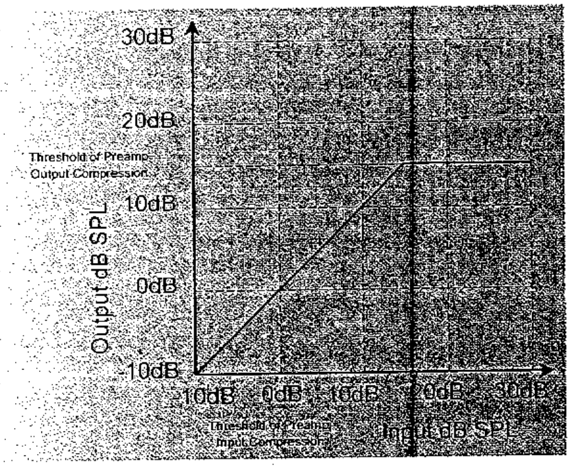


Figure 1: Pre-amplifier I/O curves showing overload protection.

Low current drain: The idle current drain is less than 600 uA, leading to extended battery life performance.

Anti-distortion limiting in the output stage: A typical Class D output stage will experience rapidly increasing distortion as the amplified signal reaches within 3 dB of the maximum power output. Additional circuitry in Sequel's amplifier controls the amplification in the Class D amplifier such that the signal at the output contains no perceptible distortion.

Extremely low distortion: The combined input and output anti-overload circuitry

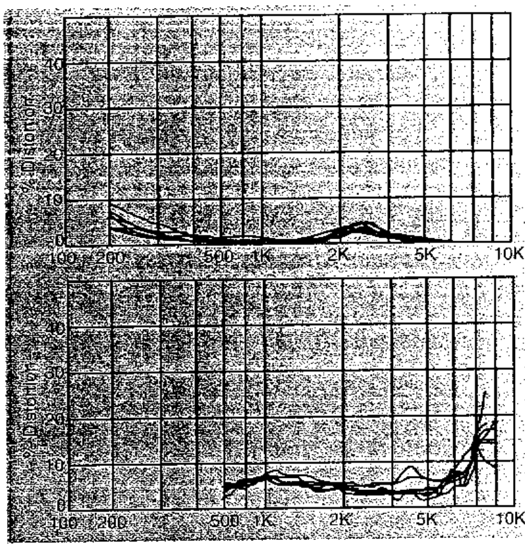


Figure 2: Harmonic Distortion (top) and Intermodulation Distortion. Inputs at 60, 65, 70, 75, 80, 85, and 90dB are overlaid.

results in typical THD and IMD figures of under 10% at all frequencies (see Figure 2).

Active filters: Second-order continuous-time active filtering provides flexibility in high- and low-frequency adjustment. Continuous-time filtering was chosen over other methods in order to provide superior noise performance. Continuous slope adjustments of up to 35 dB are possible (see Figure 3). Filtering is optimized at the factory for different receiver families.

True output limiting in the Class D output stage: Output limiting is achieved in most Class D output stages by actually limiting the gain in the preceding amplifier stage, which can still produce distortion in

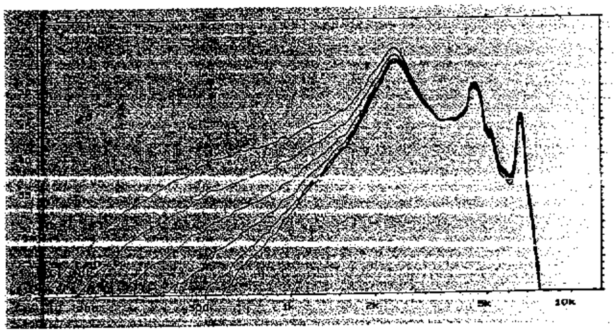


Figure 3: Active Low Cut control graph showing maximum reduction.